Water Agency Demand Response Potential

Lon W. House, Ph.D.

530.676.8956

www.waterandenergyconsulting.com

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Water Agency Peak Reduction Contribution

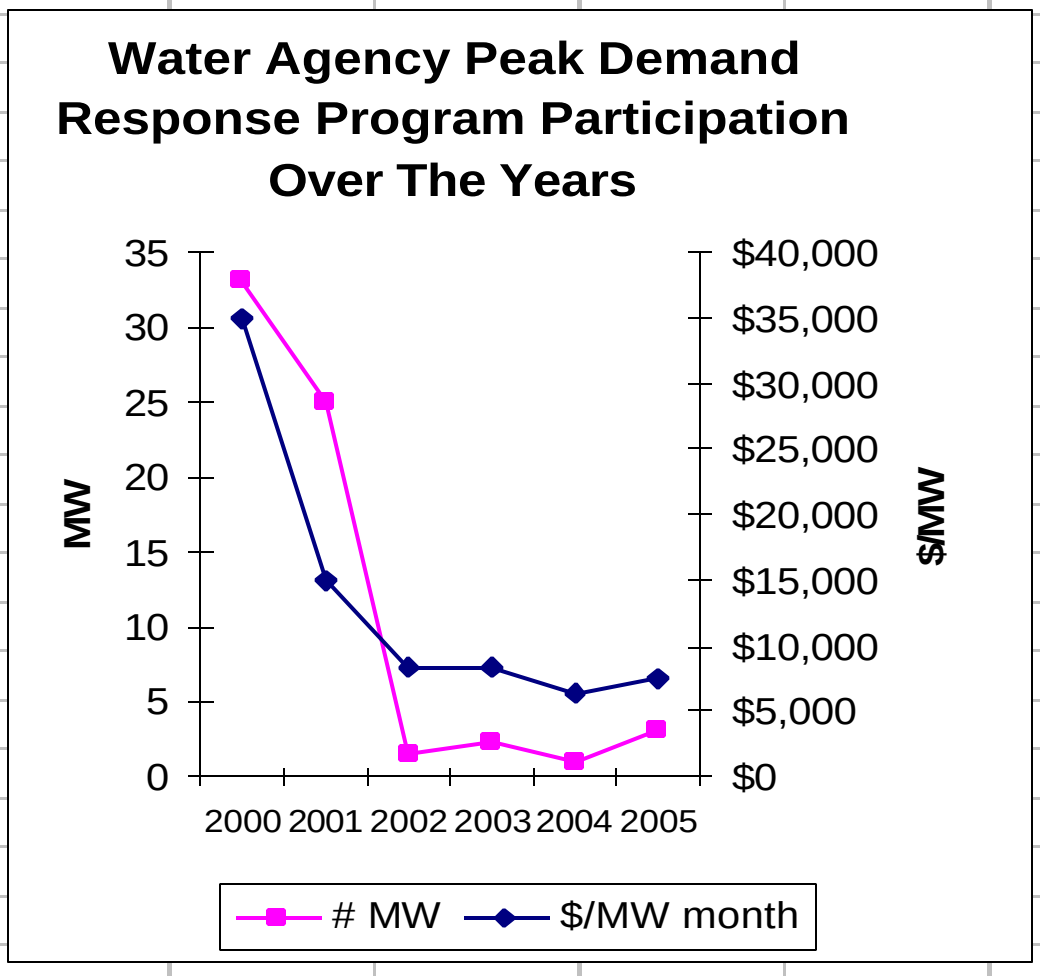
- Water agencies currently drop approximately 400 MW during the on peak period in response to TOU tariffs
- Water agencies have several hundred additional MW enrolled in utility interruptible tariffs
- Water agencies have additional capacity that has participated in demand response programs over the years
- Water agencies have hundreds of MWs of even more capacity available for curtailment if it is worth their while

Demand Response Program Observations

- Water agencies can drop additional demand but it costs them significant amounts of money and hassles
  - More sensors needed to ensure pressure maintenance and maintain water quality characteristics (primarily residual disinfection levels and nitrification which degrade when water is stored)
  - More controllers/valves needed to avoid inadvertent flows
  - Additional staffing requirements during refill periods
  - Adding additional storage cost about $1.6/gal.
- Curtailing pumping demand entails more operational risk for the water system.

Demand Program Response Over the Years Through ACWA/Ancillary Services Coalition

year	# MW	# water agencies	/MW month
2000	33	29	$35,000
2001	25	25	$15,000
2002	1.5	2	$8,250
2003	2.4	4	$8,250
2004	0.9	2	$6,375
2005	3	13	$7,500



Demand Response Necessary Payments

- Participation payment = Capacity payment
  - $85/kW-year is CPUC determined avoided capacity cost (based upon annualized CT)
  - Spread over 4 summer months = $21/kW-month ($21,000/MW month)
- Per event payment = Energy payment
  - CT heatrate x natural gas costs
- These levels - instead of current levels - guaranteed for multiple years, would yield hundreds of MW of water agency demand response.

Characteristics of an Attractive Demand Response Program

- A multi-year program
  - so water agencies can have some investment recovery period
- A demand payment for participation in the program
  - to cover necessary capital investment costs
- Payment of a fixed risk premium
  - water customers won't be impressed if their district saved the state if they run out of water, pressure, fire protection, or are required to boil water.
- A per event payment
  - to cover additional staffing requirements, component wear and tear, and replacement water costs
- Has a reasonable verification criteria
  - 10 day rolling average doesn't work. Need to be adjusted for load reduction from previous hour.
- Accurate and timely settlements
  - hassles with payments, or waiting months, cools ardor for the program
- Adequate curtailment notification
  - in time to prepare and staff up for curtailment event.

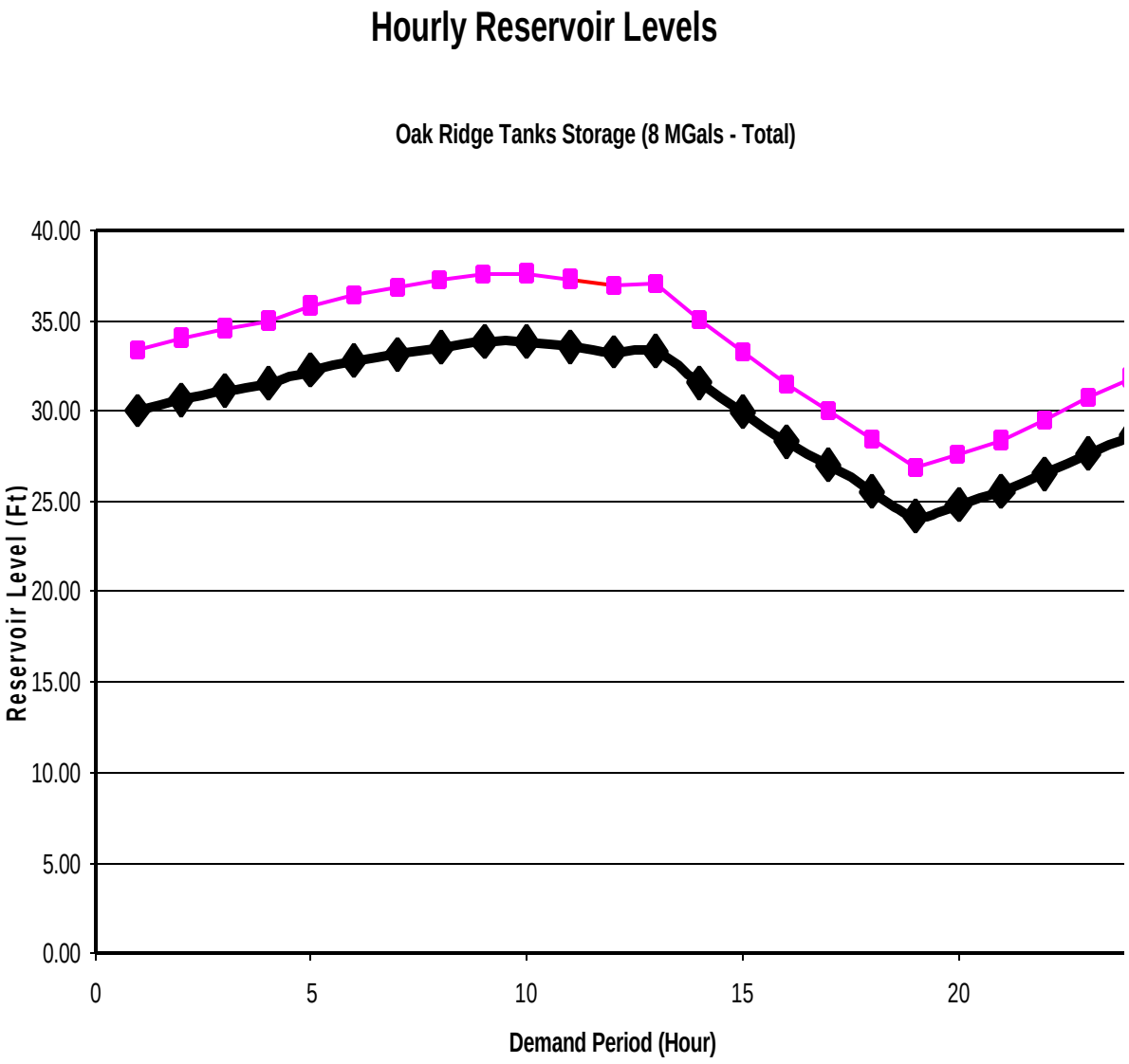
Water Agencies Ability to Reduce Peak Electricity Demand

- More aggressive use of existing system - primarily pump scheduling and storage use
  - requires system simulations to assure operators that system won't be compromised via new operations
    - continuing problems with utility payment for technical assistance
  - requires additional staffing and additional sensors and controls
    - current payment levels inadequate
    - utility rebates for sensors/controls issue
- Add or accelerate additional storage
  - need some stability in tariffs/demand response programs
  - no financial incentives for storage additions
- Peaking generation
  - Solar - new ACWA Solar Preferred Partner Program
  - Hydroelectric generation - reversible pump/turbines
- Get water customers to shift water use out of peak period
  - TOU water meters and tariffs development/case study

New Storage and More Aggressive Use of Existing Storage

- Water in storage is stored electricity
- All urban agencies have some storage, additional storage/sensors expensive
- Designed to meet water demands
- Need technical assistance to change operation for peak reductions

More Aggressive Use of Storage



Peak Response Operation of Existing Systems

Figure 5. Treatment Plant Hourly Electrical Demands
Demand Response Profile (14.5 MGal Demand)

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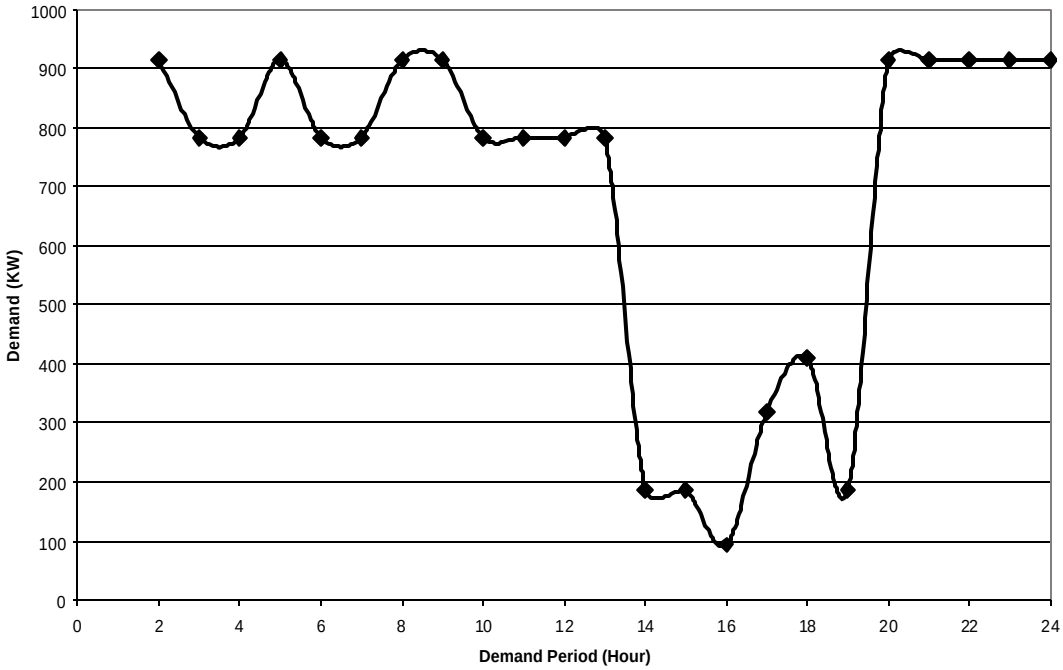
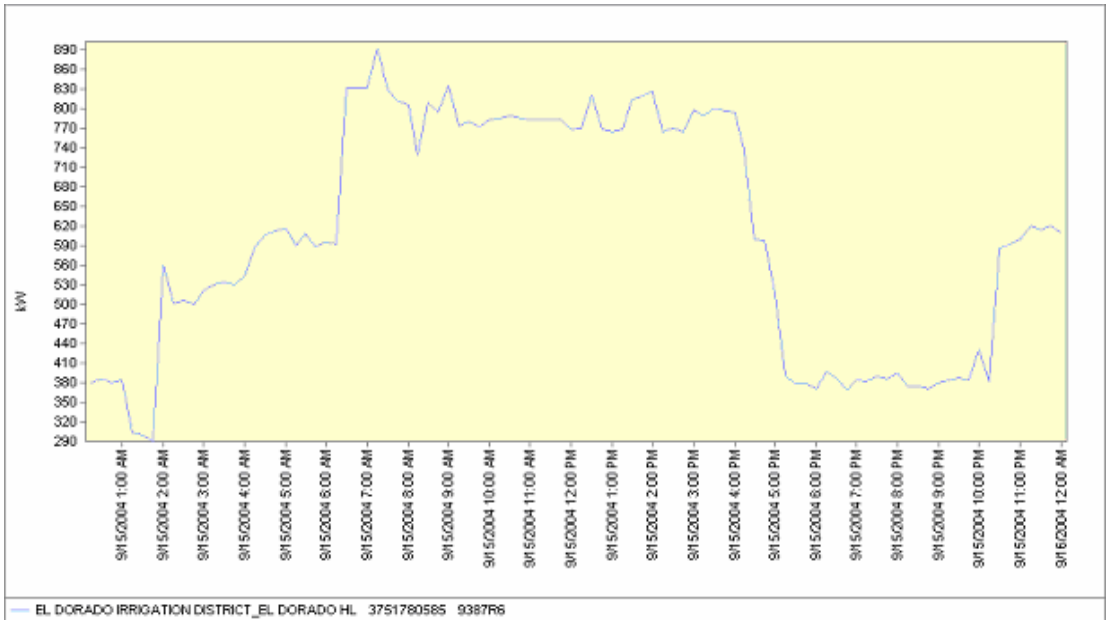
EID EDH WTP & Treated Water Pumping Facilities



Recorded Electrical Use – September 15, 2004



Folsom Lake Raw Water Pumping Station Hourly Electrical Demands
Demand Response Profile (14.5 MGal Demand)

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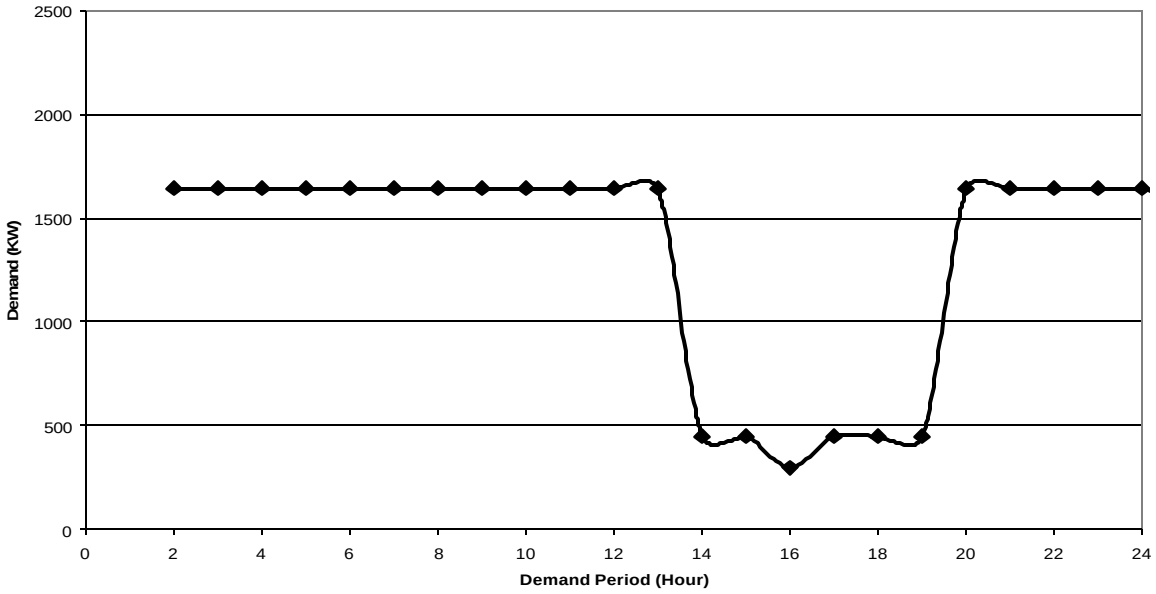
Folsom Lake Raw Water Pumping Station



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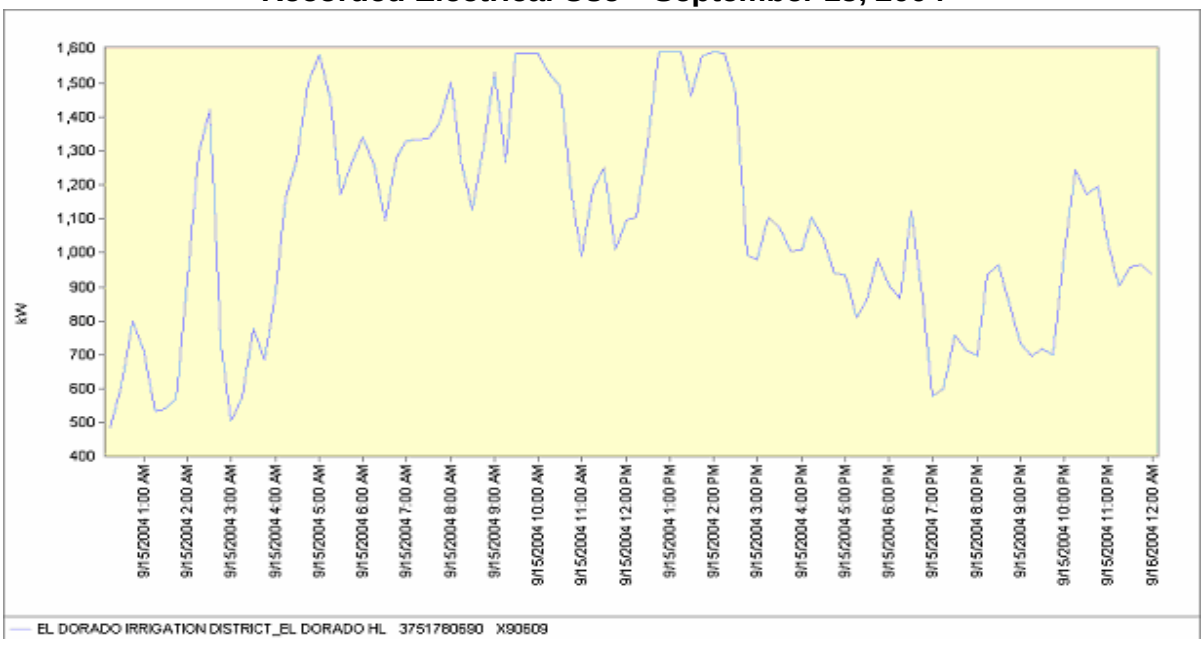

What Is Needed To Get Additional Water Agency Peak Curtailment

- This summer
  - Free up technical assistance money so we can complete studies prior to summer
  - Allow financial incentives to be used for adding water agency storage and sensors and controls
- Longer term
  - Rate design and program stability
  - Demand response program modifications- including duration and financial incentives
  - Allow financial incentives to be used for adding water agency storage and sensors and controls
  - Additional Generation
    - Solar as backup
    - Peaking hydro
  - Development and case studies in customer TOU water rates
    - TOU water meter development
    - TOU water tariffs
    - Peak shift response of water customer
- There are hundreds of additional peak MWs available
  - not if it costs us money and messes up our systems